

## **REMARKS**

### ***Status of the Claims***

Claims 1-30 are currently pending in the present application. Claims 1, 4, 5, 16, 17, 29 and 30 are currently amended. The Office Action is non-final. Claims 2, 3, 6-13 and 18-28 are withdrawn from further consideration as being directed to a non-elected invention. The Examiner objects to claims 1, 14-16, 29 and 30 as reciting non-elected subject matter. Claims 1, 4, 5, 14-17, 29 and 30 stand rejected for lacking enablement and written description, being indefinite, and being anticipated.

### ***Objections to the Claims***

The Examiner objects to claims 1, 14-16, 29 and 30 as reciting non-elected subject matter.

Presently, claim 1 has been amended to recite a modified glucose dehydrogenase wherein amino acid Thr342 and/or amino acid Asp143 of SEQ ID NO: 1 of PQQGDH derived from *Acinetobacter calcoaceticus* is replaced with other amino acid residues and has an inhibition constant (K<sub>si</sub>) of 200 mM or more. Further, claims 4, 5, 16, 17, 29 and 30 have been amended to depend from claim 1. Claims 14 and 15 are cancelled since these claims would be redundant after the current amendments.

### ***Issues Under 35 U.S.C. § 112, Second Paragraph, Indefiniteness***

Claims 1, 4, 5, 14-17, 29 and 30 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner states that the Thr366 and Asp167 do not exist in SEQ ID NO:1.

The claims have been amended to recite Thr342 instead of Thr366 and Asp143 instead of Asp167. The amino acid number recited in the original claims and specification starts at the first Met. This is clearly described in the specification at page 4, lines 23-25, "The amino acid numbering in this specification starts from the initiator methionine as the +1 position." On the other hand, the numbering in SEQ ID NO:1 starts from the N-terminus of the mature protein. The whole amino acid sequence of the enzyme was known in the art (Mol. Gen. Genet. (1989), 217: 43-436, which has been incorporated in the specification by reference), a person skilled in the art can easily understand the amino acid numbering. Therefore, it is believed that such an amendment does not introduce new matter. As such, it is respectfully requested that the Examiner withdraw the pending 35 U.S.C. §112, 2<sup>nd</sup> paragraph rejections.

***Issues Under 35 U.S.C. § 112, First Paragraph, Enablement and Written Description***

Claims 1, 14, 29 and 30 stand rejected as failing to comply with both the enablement and written description requirements of 35 U.S.C. § 112, first paragraph. In essence, the Examiner contends that the scope of the claims is broader than that which the as-filed specification discloses. The Examiner contends that the claims, directed to any modified PQQGDH having any mutation from amino acid 349-377 is not enabled by the specification. The Examiner states that although the specification provides structure of a few representative species within this broad genus, these few representatives are insufficient to support a claim directed at the entire genus of mutated PQQGDH enzymes that may fall within this category.

The amendment of claim 1 is directed at limiting the subject matter of claim 1 to that specifically supported in the specification at page 4, line 26-page 5, line 11. Applicant respectfully requests that the Examiner withdraw the pending 35 U.S.C. §112, 1<sup>st</sup> paragraph rejections.

***Issues Under 35 U.S.C. § 102(b), Anticipation***

Claims 1, 29 and 30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Breton et al., U.S. Patent No. 6,562,958 (hereinafter, “Breton”). The Examiner states that Breton discloses an amino acid sequence derived from *Acinetobacter* having 95% sequence identity with SEQ ID NO:1 and wherein Thr366, which the Examiner has presumed is actually Thr342, is replaced by alanine. Due to the high percentage identity, the Examiner states that it is likely the disclosed enzyme has all of the recited characteristics of Applicant’s enzyme as recited in the present claims.

The claims as currently amended recite that the PQQGDH has an amino acid sequence of SEQ ID NO:1 wherein amino acid Thr342 and/or amino acid Asp143 are replaced with other amino acid residues.

Breton does not teach and/or suggest the amino acid sequence of SEQ ID NO:1 nor does it teach the mutated claimed version thereof. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The fact that Breton may have 95% sequence identity is not sufficient to constitute an anticipatory teaching of Applicants’ claimed invention.

Moreover, the Breton reference does not render the claimed invention obvious. “In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for

one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). One of ordinary skill in the art would not be led to make the specific mutations to Thr342 and Asp143 of SEQ ID NO:1 as instantly claimed. Breton does not offer any teaching or suggestion of modifying its disclosure in this manner because it does not even teach SEQ ID NO:1.

The Breton reference does not teach each and every element as set forth in the present claims nor does it provide any suggestion to modify its disclosure to arrive at the claimed invention. Therefore, Applicant respectfully requests that the Examiner withdraw the standing 35 U.S.C. § 102(e) rejection and place the application in condition for allowance.


In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Gerald M. Murphy, Jr., Reg. No. 28,977 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By   
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